

EXHIBIT A

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AWS News Blog

Amazon EFS Update – On-Premises Access via Direct Connect

by Jeff Barr | on 20 DEC 2016 | in [Amazon EC2](#), [Amazon Elastic File System \(EFS\)](#), [AWS Direct Connect](#), [AWS Re:Invent](#) | [Permalink](#) | [Share](#)

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I introduced you to [Amazon Elastic File System \(Amazon EFS\)](#) last year ([Amazon Elastic File System – Shared File Storage for Amazon EC2](#)) and announced production readiness earlier this year ([Amazon Elastic File System – Production-Ready in Three Regions](#)). Since the launch earlier this year, thousands of AWS customers have used it to set up, scale, and operate shared file storage in the cloud.

**Elastic File System**
Fully Managed File System for EC2

Today we are making EFS even more useful with the introduction of simple and reliable on-premises access via [AWS Direct Connect](#). This has been a much-requested feature and I know that it will be useful for migration, cloudbursting, and backup. To use this feature for migration, you simply attach an EFS file system to your on-premises servers, copy your data to it, and then process it in the cloud as desired, leaving your data in AWS for the long term. For cloudbursting, you would copy on-premises data to an EFS file system, analyze it at high speed using a fleet of [Amazon Elastic Compute Cloud \(Amazon EC2\)](#) instances, and then copy the results back on-premises or visualize them in [Amazon QuickSight](#).

You'll get the same file system access semantics including strong consistency and file locking, whether you access your EFS file systems from your on-premises servers or from your EC2 instances (of course, you can do both concurrently). You will also be able to enjoy the same multi-AZ availability and durability that is part-and-parcel of EFS.

In order to take advantage of this new feature, you will need to use Direct Connect to set up a dedicated network connection between your on-premises data center and an [Amazon Virtual Private Cloud \(VPC\)](#). Then you need to make sure that your filesystems have mount targets in subnets that are reachable via the Direct Connect connection:

Configure file system access

An Amazon EFS file system is accessed by EC2 instances running inside one of your VPCs. Instances connect to a file system via a network interface called a mount target. Each mount target has an IP address, which we assign automatically or you can specify.

VPC vpc-e68d9c81 - Default...

Create mount targets

Instances connect to a file system via mount targets you create. We recommend creating a mount target in each of your VPC's Availability Zones so that EC2 instances across your VPC can access the file system.

Availability Zone	Subnet	IP address	Security groups
<input checked="" type="checkbox"/> us-east-1a	subnet-75a56749 (default)	Automatic	sg-98fa09e5 - default
<input checked="" type="checkbox"/> us-east-1b	subnet-009a1149 (default)	Automatic	sg-98fa09e5 - default
<input checked="" type="checkbox"/> us-east-1c	subnet-b85488e3 (default)	Automatic	sg-98fa09e5 - default
<input type="checkbox"/> us-east-1d			
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Cancel

Next Step

You also need to add a rule to the mount target's security group in order to allow inbound TCP and UDP traffic to port 2049 (NFS) from your on-premises servers:

sg-98fa09e5

SummaryInbound RulesOutbound RulesTags

Cancel

Save

Type	Protocol	Port Range
Custom TCP Rule	TCP (6)	2049
Custom UDP Rule	UDP (17)	2049

Add another rule

After you create the file system, you can reference the mount targets by their IP addresses, NFS-mount them on-premises, and start copying files. The IP addresses are available from within the [AWS Management Console](#):

Mount targets							
VPC	Availability Zone	Subnet	IP address	Mount target ID	Network interface ID	Security groups	Life cycle state
vpc-e68d9c81 - DefaultVPC (default)	us-east-1a	subnet-75a56749 (default)	172.31.44.183	fsmt-e82ef0a1	eni-ef59e106	sg-98fa09e5 - default	Available
	us-east-1c	subnet-b85488e3 (default)	172.31.27.88	fsmt-eb2ef0a2	eni-40faa38e	sg-98fa09e5 - default	Available
	us-east-1b	subnet-009a1149 (default)	172.31.9.69	fsmt-ed2ef0a4	eni-16677cfc	sg-98fa09e5 - default	Available

The Management Console also provides you with access to step-by-step directions! Simply click on the **On-premises mount instructions**:

File system access

DNS name .efs.us-east-1.amazonaws.com

Amazon EC2 mount instructions

AWS Direct Connect mount instructions

Mount targets

And follow along:

AWS Direct Connect mount instructions

You can mount an EFS file system on an on-premises server by using an AWS Direct Connect connection

Setting up your on-premises server

1. Establish an [AWS Direct Connect](#) connection.

2. Using the [Amazon EC2 console](#), add a rule to the mount target security group to allow inbound traffic to NFS port (2049) from the on-premises customer network. [Learn more](#)

3. Open an SSH client and connect to your on-premises server.

4. Install the nfs client on your on-premises server.

On a Red Hat Enterprise Linux or SuSE Linux server:

sudo yum install -y nfs-utils

On an Ubuntu server:

sudo apt-get install nfs-common

Mounting your file system

Mounting your file system

1. Open an SSH client and connect to your on-premises server.
2. Create a new directory on your on-premises server, such as "efs".

```
• sudo mkdir efs
```

Close

This feature is available today at no extra charge in the US East (N. Virginia), US West (Oregon), Europe (Ireland), and US East (Ohio) Regions.

— Jeff;

TAGS: [AWS re:Invent](#)

**Jeff Barr**

Jeff Barr is Chief Evangelist for AWS. He started this blog in 2004 and has been writing posts just about non-stop ever since.

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